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10/606,638	06/26/2003	Willi Kreuder	512667-3479.2.	5023

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EXAMINER

YAMNITZKY, MARIE ROSE

ART UNIT	PAPER NUMBER
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1774

DATE MAILED: 03/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/606,638

Applicant(s)

KREUDER ET AL.

Examiner

Marie R. Yamnitzky

Art Unit

1774

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13 and 16-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13, 16-24 and 28-30 is/are rejected.
- 7) ☒ Claim(s) 25-27 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

1. This Office action is in response to applicant's amendment filed January 17, 2006, which cancels claims 11 and 12, and amends claims 13, 16 and 20.

Claims 13 and 16-30 are pending.

2. The rejection under 35 U.S.C. 112, 1st paragraph, as set forth in the Office action mailed July 15, 2005, is partly overcome by applicant's amendment. The remaining issue is set forth later in this action.

The prior art rejections of claims 11 and 12 are rendered moot by claim cancellation.

The rejection of claims 13, 16, 19-21, 23 and 28 under 35 U.S.C. 102(b) based on Horhold et al. (GB 1345692) is overcome by applicant's amendment. Claim 13 has been amended to include the limitations of prior claim 12, and claims 16, 20, 21, 23 and 28 now depend ultimately from claim 13. The reference is reapplied under 35 U.S.C. 103(a) in this action.

The rejection of claims 13, 16 and 19-24 under 35 U.S.C. 102(b) based on Hoerhold et al. (*Journal fuer Praktische Chemie (Leipzig)*), 316(5), 750-760 (1974)) is overcome by applicant's amendment. Claim 13 has been amended to include the limitations of prior claim 12, and claims 16 and 20-24 now depend ultimately from claim 13. The reference is reapplied under 35 U.S.C. 103(a) in this action.

Claim 19 has not been amended, and references a cancelled claim for the limitations of the electroluminescent material. For purposes of comparing to the prior art, claim 19 is interpreted as if dependent from claim 13.

3. Claim 21 stands rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Support for the subgenus of polymers defined by claim 21 is not clear.

4. Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The limitations of claim 19 are not clear as dependent from claim 11, which has been cancelled.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 13, 16, 19, 20, 23, 28 and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Hosokawa et al. (EP 0 557 534 A1).

Claim 19 is included in this rejection as if dependent from claim 13.

Hosokawa et al. disclose copolymers comprising a repeating unit of present formula (I), and teach that the copolymers may be used in an active layer of an organic electroluminescent (EL) device.

While the present claims require 2 to 1000 structural units of formula (I), the claim language is open and multiple units of formula (I) may be indirectly connected to each other via units that are not of formula (I). Accordingly, copolymers such as made by Hosokawa's Synthesis Example 11 (pp. 38-39), Synthesis Examples 24 and 25 (pp. 52-54), Synthesis Examples 27-29 (pp. 55-57), Synthesis Examples 32, 34 and 35 (pp. 58-61) and Synthesis Example 37 (pp. 61-62) meet the limitations of the electroluminescent material as claimed in present claim 11 and various dependent claims. See page 62, line 33-p. 66, l. 44 for descriptions of EL devices made with some of these copolymers.

Based on the Mw values disclosed in Hosokawa's Synthesis Examples, it is reasonable to expect that the prior art copolymers meet the limitations regarding the number of structural units of formula (I) as set forth in present claim 13.

The copolymer made by Hosokawa's Synthesis Example 25 is an example of a polymer containing structural units of formula (II) as set forth in present claim 16 and further defined in claims 20 and 23.

The copolymer made by Hosokawa's Synthesis Example 32 is an example of a polymer containing structural units of the formula set forth in present claim 29.

7. Claim 30 stands rejected under 35 U.S.C. 102(b) as being anticipated by Horhold et al. (GB 1345692) for reasons of record in the Office action mailed July 15, 2005.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 13, 16, 19-21, 23 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horhold et al. (GB 1345692).

Claim 19 is included in this rejection as if dependent from claim 13.

The prior art discloses polymers containing structural units of present formula (I), produced by subjecting an organophosphorus compound of present formula (III) to a condensation reaction with a diketone of present formula (II). See the whole patent. See Examples 1 and 5 in particular.

Note that although the formulae shown in prior art Examples 1 and 5 are slightly different than present formula (I), multiple repeating units of the formulae shown in the prior art examples, bonded directly to each other, provide repeating units containing structural units of present formula (I).

With respect to the present preamble recitation of "electroluminescent", the only positive limitation of the presently claimed electroluminescent material is a polymer containing structural

units of formula (I), which the prior art anticipates, and the only positive limitation of the presently claimed electroluminescent device is a layer of the material, which the prior art also anticipates.

The prior art does not limit the number of structural units in the polymers as required by present claim 13 and claims dependent therefrom. Absent a showing of criticality for the size of the polymer as limited by claim 13, it is the examiner's position that it would have been within the level of ordinary skill of a worker in the art to make polymers having various degrees of polymerization (i.e. various numbers of repeating units). It would have been within the level of ordinary skill of a worker in the art at the time of the invention to determine suitable and optimum degrees of polymerization for the prior art polymers to be used according to the prior art, guided by factors such as physical properties associated with polymers of different degrees of polymerization. For example, viscosity generally increases as degree of polymerization increases. Accordingly, one of ordinary skill in the art would have been motivated to provide a polymer having an appropriate viscosity for solution coating if a film of the polymer was intended to be made by solution coating.

10. Claims 13, 16 and 19-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoerhold et al. (*Journal fuer Praktische Chemie (Leipzig)*), 316(5), 750-760 (1974); see AN 1975:43937 (HCAPLUS).

Claim 19 is included in this rejection as if dependent from claim 13.

Based on AN 1975:43937 (HCAPLUS), the prior art discloses polymers containing structural units of present formula (I).

The polymers represented by each of the eight formulae shown in AN 1975:43937 meet the limitations of a polymer as defined in present claim 13, except there is no explicit disclosure of the number of structural units of formula (I) as required by claim 13.

Note that although the second and third formulae shown are slightly different than present formula (I), multiple repeating units of either formula, bonded directly to each other, provide repeating units containing structural units of present formula (I).

The polymer represented by the first formula is an example of a polymer that further meets the limitations of present claims 16, 20 and 23 (with the exception of the number of structural units as noted above with respect to claim 13).

The polymer represented by the second formula is an example of a polymer that further meets the limitations of present claims 16, 20 and 21 (with the exception of the number of structural units as noted above with respect to claim 13).

The polymer represented by the eighth formula is an example of a polymer that further meets the limitations of present claims 16, 20, 22 and 24 (with the exception of the number of structural units as noted above with respect to claim 13).

The prior art does not limit the number of structural units in the polymers as required by present claim 13 and claims dependent therefrom. Absent a showing of criticality for the size of the polymer as limited by claim 13 and claims dependent therefrom, it is the examiner's position that it would have been within the level of ordinary skill of a worker in the art to make polymers

having various degrees of polymerization (i.e. various numbers of repeating units). It would have been within the level of ordinary skill of a worker in the art at the time of the invention to determine suitable and optimum degrees of polymerization for the prior art polymers to be used according to the prior art, guided by factors such as physical properties associated with polymers of different degrees of polymerization. For example, viscosity generally increases as degree of polymerization increases. Accordingly, one of ordinary skill in the art would have been motivated to provide a polymer having an appropriate viscosity for solution coating if a film of the polymer was intended to be made by solution coating.

With respect to the present preamble recitation of “electroluminescent”, the only positive limitation of the presently claimed electroluminescent material is a polymer containing structural units of formula (I), which the prior art anticipates, and the only positive limitation of the presently claimed electroluminescent device is a layer of the material, which the prior art also anticipates (the abstract indicates that “films” were tested).

11. Claims 13, 16-20, 23 and 30 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Friend et al. (WO 90/13148) for reasons of record as set forth in the Office action mailed July 15, 2005, with the following modifications.

Claim 13 has been amended to include the limitations of prior claim 12. Accordingly, the examiner’s position set forth in the July 15th action regarding the number of structural units as required by claim 12 is now applicable to claim 13 and claims that depend directly or ultimately from claim 13. Claim 19 is included in this rejection as if dependent from claim 13.

12. Applicant's arguments filed January 17, 2006 have been fully considered but they are not persuasive.

With respect to the rejection of claim 21 under 35 U.S.C. 112, 1st paragraph, applicant argues that claim 21 is supported by Examples 1-4, 10 and 12. It is the examiner's position that these six examples do not provide sufficient support for the subgenus defined by claim 21, in which A¹ and A² may be selected from numerous possibilities other than those used in these examples.

With respect to the rejection under 35 U.S.C. 102(b) based on Hosokawa et al., applicant argues that Hosokawa's copolymers are outside the scope of the present claims. Applicant's arguments refer to "a nitrogen bonded to three separate phenyl groups - see Example 11 on page 38 of Hosokawa" and "a compound with 'too many' substituents". Applicant also refers to a formula on page 52 which is part of Reference Example 4 of Hosokawa's disclosure.

The present claim language is open. While the polymer must contain 2 to 1000 structural units of the formula (I), the polymer is not restricted from containing structural units that are not of the formula (I). Accordingly, structural units such as the nitrogen-containing units in the copolymer of Hosokawa's Example 11 are not excluded by the present claim language. The copolymer of Hosokawa's Example 11 comprises the following structure, wherein the underlined portion is a structural unit of present formula (I): -O-Ph-N(Ph)-Ph-C(Ph)=CH-Ph-Ph-CH=C(Ph)-Ph-N(Ph)-Ph-O-C(O)-. Hosokawa's copolymer of Example 11 contains more than one portion of the preceding structure. A similar analysis is applicable to the copolymers of other Examples of Hosokawa et al. as referenced by the examiner. As noted in the rejection, based on the Mw

values disclosed in Hosokawa's Synthesis Examples, it is reasonable to expect that the prior art copolymers meet the limitations regarding the number of structural units of formula (I) as set forth in present claim 13.

With respect to the rejections based on the Horhold et al. GB reference, applicant refers to page 2, lines 10-13 of the patent for the description of R. Although the phenylene units of Horhold's polymers may be substituted with R possibilities outside the scope of R as defined in the present claims, Horhold's possibilities of R = hydrogen, alkyl and alkoxy are within the scope of the present claims. Further, Horhold et al. disclose specific examples meeting the limitations of R of the present claims.

Applicant also presents a formula depicting a structure containing two structural units of present formula (I) and a formula depicting the corresponding structure that would be provided by formula (I) of the Horhold et al. GB reference when n=2. Horhold et al. do not explicitly limit the value of n. When n=3 in Horhold's formula (I), the prior art polymer contains two structural units of present formula (I), when n=4 in Horhold's formula (I), the prior art polymer contains three structural units of present formula (I), and so forth. For example, when Horhold's polymer of Example 1 has n=3, the polymer contains the following structure =C(Ph)-Ph-C(Ph)=CH-Ph-CH=C(Ph)-Ph-C(Ph)=CH-Ph-CH=C(Ph)-Ph-C(Ph)=CH-Ph-CH= wherein the underlined portion is two structural units of present formula (I).

With respect to the rejection based on the Hoerhold et al. literature reference, applicant's arguments do not comply with 37 CFR 1.111(c) because they do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art

disclosed by the reference cited. Applicant appears to admit that the prior art discloses species within the scope of the presently claimed genus. A reference that discloses a species within the scope of a claimed genus anticipates the claimed genus. See MPEP 2131.02. (In the present case, the examiner has made the rejection under 35 U.S.C. 103(a) instead of 102(b) because it is not clear whether the prior art explicitly discloses the "2 to 1000" structural units limitation that has been added to claim 13, with claims dependent therefrom.)

With respect to the rejection based on Friend et al., applicant argues that there are differences between the monomer units of the present invention and Friend's monomer units. Applicant further argues that Friend et al. do not teach or suggest any substitution pattern, and even if substitution was taught or suggest, Friend et al. would not suggest the specific substitution pattern of applicant's claimed invention.

The examiner disagrees with applicant's argument that Friend et al. do not teach or suggest substitution. As noted in the rejection, Friend et al. disclose poly(1,4-phenylene-1-phenylvinylene). This is a polymer of the monomer unit depicted for Friend on page 16 of applicant's response wherein the first H of each -CH=CH- group is replaced by a phenyl group. As admitted in the rejection, this is not the same substitution pattern as in present applicant's structural unit of formula (I), but it is a position isomer thereof. Applicant has presented no persuasive evidence demonstrating superior/unexpected results achieved by the present invention compared to the applied prior art.

13. The following miscellaneous issues, previously noted in the Office action mailed July 15, 2005, remain:

In line 2 of claim 28, "containg" should read --containing--.

In line 2 of claim 29, "of" should be deleted.

14. Claims 25-27 stand objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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16. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

The current fax number for all official faxes is (571) 273-8300. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

MRY
March 24, 2006



MARIE YAMNITZKY
PRIMARY EXAMINER

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